Bradley Gunnery Evolution

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Bradley gunnery, as experienced by one mechanized infantry battalion over a six-year period, seems to have undergone an interesting evolution.

The battalion, the 1st of the 41st Infantry, was the first to receive the M-2 Bradley Infantry Fighting Vehicle (BIFV). It did so in March 1983 and a few of its present officers and noncommissioned officers have served continuously in the unit since those early days. Additionally, the battalion was the first Bradley unit to rotate to the National Training Center; it was the first COHORT battalion; and it was the first Bradley battalion to rotate to Germany from the continental United States. All of these "firsts" have had an effect on the way the battalion has conducted gunnery, and they represent a continuing process of searching for solutions, of innovation and adaptation. The failures have been, at times, equal to the triumphs.

This examination of the six-year period focuses on gunnery. It is not intended to be a detailed critique of methods or a debate on doctrine, tactics, or standards. It is simply a historical record of what occurred year by year as a group of infantrymen learned to qualify with a new weapon in various environments from the hot, arid ranges of Fort Hood to the frozen snow of Grafenwoehr in Germany.

This record deals with the evolving concepts, techniques,

or standards in the following areas: gunnery philosophy, pre-gunnery train-up, pre-qualification tables, qualification, targets (types and ranges), ammunition, fire commands, burst techniques, sensing and adjusting rounds, controlling firing vehicles, methods of grading crew cuts, scoring target kills and times, after action reviews, and additional gunnery tables.

1983

The battalion's gunnery philosophy in 1983 was in its embryonic stage. There was great concern about making sure Bradley gunnery did not fragment the infantry squad into two distinct elements--the vehicle crew and the dismounted rifle team. Another concern was the integration of realistic tactics--from movement techniques to spot reporting--into the gunnery exercises. Although engagement time for steel on target was considered important, it was not paramount. The great debate was about who should dismount with the rifle team--the squad leader or the assistant squad leader.

The pre-gunnery train-up involved the Bradley Gunnery Skills Test (BGST) and Bradley Commander Proficiency Course (BCPC) drills. The BGST consists of a series of technical tests on the vehicle's weapons. The BCPC drills teach crew skills by rolling the vehicle on a mock-up gunnery course without live ammunition.

Pre-qualification Tables VI and VII were conducted in 1983. Table VI, day and night, consisted of a stationary Bradley firing at stationary and moving targets with subcaliber (7.62mm) and full caliber (25mm) ammunition. Table VII, day and night, consisted of a moving (offensive) and stationary (defensive) Bradley firing at moving or stationary targets with subcaliber and full caliber ammunition.

Table VIII, the squad qualification table, consisted of ten day and eight night vehicle targets with a mixture of single, dual, and triple engagements. The conditions included gunner's hand station, commander's hand station, NBC protective mask, day sight, thermal night sight, and auxiliary sight. Although no TOW antitank missiles were fired, the crew had to simulate firing them.

The infantry rifle team, led by the squad leader/Bradley commander, was required to dismount and establish a hasty defense, engaging E-type targets with rifles while the assistant squad leader fired at a vehicle target with the Bradley's 25mm cannon. The squad was also required to engage targets with the M231 firing port weapons from inside the vehicle. (The dismount portion was not conducted in the night phase.) A dry run without ammunition was conducted on this table before the qualification run.

Three types of targets were used on the range--infantry E-types, hard targets of old vehicle hulls, and large square plywood panels raised and lowered by lifting devices or placed on moving trolleys. Night firing was done at hard targets that had retained the daytime heat and continued to give a good thermal signature all night if charcoal fires were built inside the hulls. Target ranges were out to 2,200 meters.

Ammunition for the 25mm gun included armor-piercing discarding sabot with tracer (APDS-T, or AP) with flight ballistics of 1,000 meters in 0.8 seconds; high explosive incendiary with tracer (HEI-T, or HE) with flight ballistics of 1,000 meters in 1.2 seconds; 7.62mm linked for the coaxial machinegun; 5.56mm tracer for the firing port weapons; and standard small arms ammunition for the dismounted squad.

The battlesight fire command was the preferred command. Battlesight was usually AP ammunition with 1,200-meter range pre-selected. The elements of the fire command were alert, battlesight, target description, and command of execution.

When engaging distant targets, or if time was available, the precision fire command was used. It had the same basic elements, but the ammunition and range were substituted for the word "battlesight."

The use of the proper fire command was not critical at this time, however, and in the average engagement, the command was quite informal.

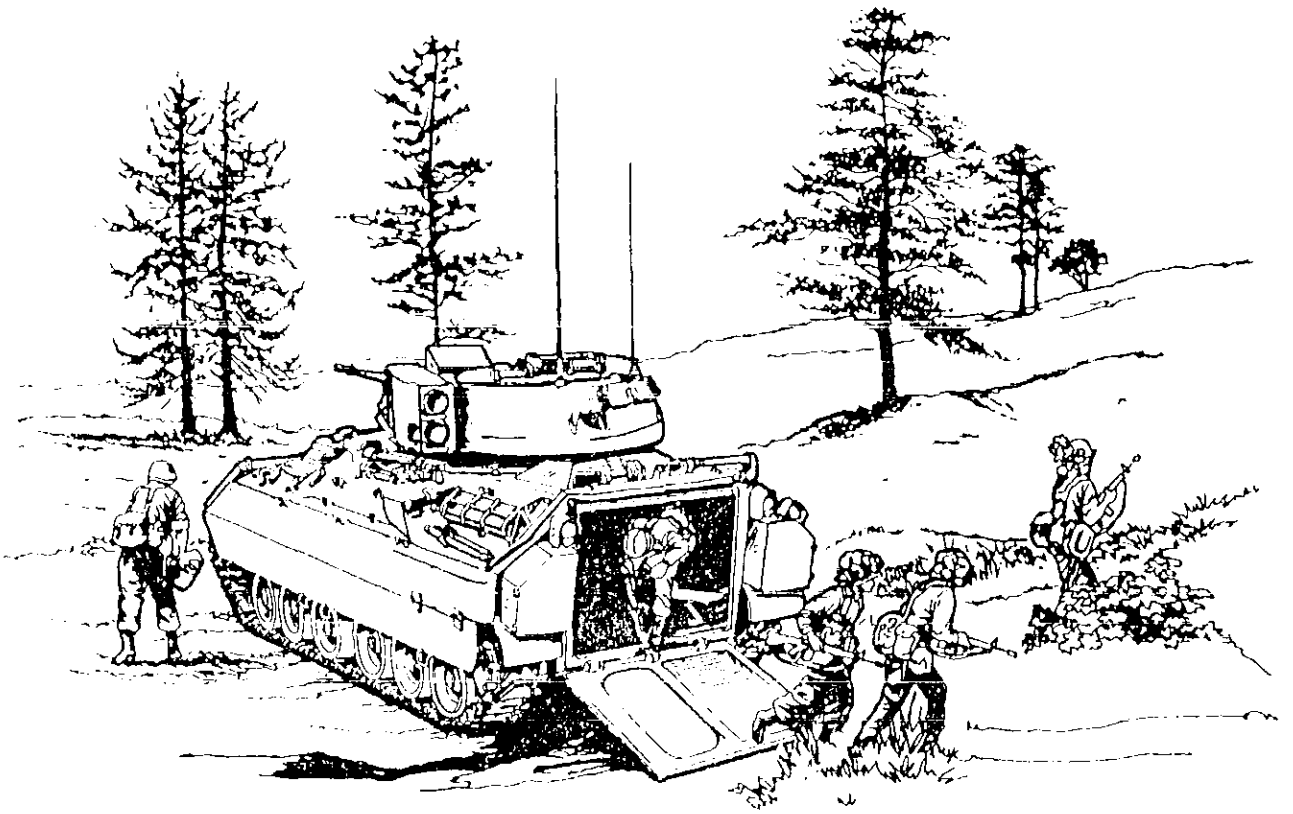
The burst technique used to fire the main gun was a single sensing round fired on the single shot setting followed by a switch to high rate and three-to-five-round bursts adjusted according to the hit location of the single sensing round. (This is known as burst on target, or BOT.) Most gunners learned to fire a single round by careful trigger control, even when using the high rate of fire.

There was no established sensing technique: The BC's sensing of the strike of a round was relayed to the gunner in terms such as "too high," "a little left," or "way right."

The firing vehicle was controlled by a chase track, usually an M113 armored personnel carrier. This chase vehicle, called "Control" or "Tower," gave radio instructions to the firing vehicle and controlled its movement through the course by issuing a series of tactical commands--for example, "C12, this is Control; move from battle position three to battle position four; a BMP is reported as being in the vicinity of target reference point one." The firing Bradley would move out, the target would come up, and the engagement would begin.

Crew actions were graded by a Bradley crew evaluator (BCE) sitting on top of the firing Bradley's commander's hatch. The BCE wore a CVC helmet plugged into the crew intercom. There were few point cuts for improper crew actions or commands, but the BCE would later give a critique of the way the crew went about its business and would offer suggestions for improvement. He had a clipboard and a stopwatch for determining the length of time the crew took to kill a target. He also determined if a target had been hit with three rounds to credit a kill. (At night a second BCE, called a "spotter," used the thermal sights of a chase Bradley to determine kills.) Thirty seconds to kill a target was considered the limit. The BCE team for evaluating the qualification table was made up of the battalion's skilled senior sergeants and lieutenants.

The after action review (AAR) was conducted in a tent containing a sketch of the range. Each engagement was discussed in general, and a gentle critique was offered with suggestions for improvement.



There were no formal tables for higher unit levels, but a platoon battle exercise was conducted that emphasized movement to contact, actions in the overwatch, and hasty defense.

The major problem in 1983 was the crews' unfamiliarity with the new weapons, particularly the 25mm cannon. Misfires were common, almost all due to crew error. This problem was initially solved, however, by the return to the battalion in July of the sergeants who had been sent to the Master Gunner Course at Fort Benning. Then the battalion began to develop a pool of true technical experts at company level.

1984

The battalion's gunnery philosophy in 1984 emphasized tactical realism and the dirty battlefield. Two gunneries were conducted—one in March, another in August. The first was a part of the battalion's preparations for its rotation to the National Training Center (NTC); the second was heavily influenced by the lessons learned there and centered on an experiment in section gunnery.

Ranges were obscured by smoke from canisters and burning tires to condition the crews to operating and engaging targets on a dirty battlefield. Tactical realism was paramount. The guiding concept—gunnery as a preparation for combat—translated into tough dismounted infantry missions, with firing vehicles free of administrative measures such as red flags or chase tracks.

FM 23-1 (Test), Bradley Fighting Vehicle Gunnery (8 December 1983) reached the battalion early in 1984. The common view of this document was that it represented an excellent reference and a good training guide, and many of the techniques it offered were immediately adopted. Some of the ideas in it had, in fact, originated in the battalion. It was also viewed, however, as a good point of departure, particularly in the structure of gunnery tables, crew cuts, and time standards. And, as it was clearly labeled "Test," there was no particular requirement to adhere to its standards.

To the previous pre-gunnery train-up using BGST and BCPC drill was added the mini-tank range, an engagement exercise involving single-shot subcaliber (5.56mm) ammunition and miniature targets at ranges of less than 100 meters. Range estimation exercises became important for the Bradley commander.

Pre-qualification during the March gunnery consisted of firing Tables V, VI, and VII, both day and night. Table V consisted of a stationary (defensive) Bradley firing full caliber and subcaliber ammunition at moving and stationary targets. During Table VI, the Bradley was both defensive and offensive (moving). Table VII, used for refining crew duties and engagement techniques, involved only subcaliber (7.62mm) defensive and offensive engagements. For the August gunnery, Tables V and VI remained the same while Table VII became a qualification table.

The qualification tables changed radically between the two gunneries. Table VIII A&B (A—day, B—night) for the March gunnery was the same used in 1983 with the following changes: 13 vehicle targets, an offensive rather defensive dismounted team maneuver, and a firing over the back

deck engagement. No dry run was allowed for Table VIII with the exception of a walk-through of the dismounted maneuver operation for safety purposes.

Qualification during the August gunnery consisted of Tables VII A&B and VIII A&B. Table VII became the Bradley crew qualification without a dismounted infantry mission. Eleven vehicle targets were engaged. The firing vehicle negotiated the course with the section's other Bradley, his wingman, helping spot rounds.

Table VIII, Section Qualification, required firing at 15 vehicle targets and engaging one tank target with TOW MILES. Either vehicle could shoot at the targets. A multiple-vehicle engagement task (with three vehicles) was also in the table, but no dismounted mission was included for the rifle team. (This lack of a dismounted role was rather strongly contested, and it was restored in subsequent battalion-controlled gunneries.)

In the interest of doing everything possible to increase tactical realism, a good bit of energy was expended cutting the square plywood targets into proper threat vehicle silhouettes. (A BMP target should look like a BMP.)

The most important target development during 1984 was the addition of thermal targets for Bradley night firing. Thermal blankets were stapled to the plywood silhouettes and connected to a generator. Initially, there was difficulty getting the targets to heat up as expected, and preparing them required a considerable amount of labor on the part of range operations. Firing time was lost if careful planning and a large detail were not employed in the frequent repair of targets and servicing of generators. Targets were emplaced out to 2,200 meters.

SUBSTITUTION

Because it was known to produce dangerous duds, the explosive ammunition HEI-T was deleted from gunnery ammunition and replaced by target practice with tracer (TP-T) ammunition, which has the same ballistic characteristics. Armor piercing (AP) 25mm and 7.62mm for the coaxial machinegun were also used. Seven rounds were allowed for each vehicle target if firing TP-T, five rounds if using AP. (AP was used on far targets, more than 1,800 meters, and TP-T for near ones.) FM 23-1 (Test) suggested ten rounds per target.

The fire commands remained the same, but there was an increased emphasis on using the correct ones. The burst technique was stabilized into a pattern of 1-3-3.

The use of section gunnery and the need for the wingman to help spot rounds and call their effects over the radio helped encourage the use of a formal system of sensing and adjusting rounds but did not require it. Sensing calls of *lost, short, over, line, doubtful left* and *right* were adopted from the Armor community, and adjustments were made in terms of the target size, such as "one-half target from right."

The earlier chase vehicles and the Bradley crew evaluator perched on the firing turret were eliminated in the interest of tactical realism. Firing vehicles were controlled by radio using tactical scenarios and commands. For safety, however, the firing vehicle was observed at all times from the tower or some other suitable location.

A BCE rode in the back of the Bradley to monitor crew actions and fire commands. Target exposure and target kill were timed and observed from the tower. At night or through smoke, a dismounted TOW thermal sight was used, and a time of 20 seconds was allowed for a satisfactory target kill.

Three 25mm rounds in the target were required for a kill during the March gunnery, but only a single round during the August gunnery. This change was based on the fact that the target dropped automatically when struck by the first round. Later, the three-strike sensor was employed. (The test FM 23-1 suggested 15 seconds and three rounds.) The coaxial machinegun engagements were graded by a four-fifths pattern for an area target.

For the August gunnery, in addition to points earned for target kills, a crew was scored on total time on the course. For example, completing Table VII in 30 to 35 minutes yielded 50 points, in 76 to 80 minutes only five points. No points were deducted for crew cuts such as improper fire commands.

To qualify, a crew had to achieve 560 total points and hit 75 percent of the targets. Crews were rated Distinguished (720-800), Superior (640-719), or Qualified (560-639).

ALIBIS

Alibis—that is, refiring engagements—were refused in cases where the malfunction of weapons or vehicles could have been prevented by proper crew checks or maintenance.

Dramatic changes in the after action review came in 1984. Influenced by the ruthless AARs the battalion had experienced at the NTC, the event evolved from a discussion and suggestion session to a review with a strict format. It started with an extensive self-analysis by a crew, followed by the BCE's dissection of the crew's actions. The final portion involved a coaching session for future improvement.

During the March gunnery, a company team combined arms live fire exercise (CALFEX) was fired in preparation for the task force live fire at the NTC. Under "hot" conditions, the company teams (two mechanized, one tank platoon) did a movement to contact, a hasty attack, a breach of obstacles, and a night defense. During the August gunnery, the battalion conducted Table IX, the platoon live fire exercise.

Rigorous gunnery selection criteria were instituted by the battalion in 1984. Soldiers selected to be gunners had to pass a gunner's physical (including an eye test), score at least 32 out of 40 on the rifle qualification, successfully complete a series of turret-manipulation exercises, have an above average GT or SQT score, and have 12 months of retainability in the unit.

One of the year's major challenges was crew stability. No sooner would a crew gain experience and become qualified than the gunner or BC would move on, for various reasons.

The COHORT program helped to ease this problem, however.

Another issue was the number of gunneries a battalion should fire in a year. FM 23-1 (Test) called for three—two qualification and one ARTEP. Because of the intensive requirements for training in other infantry skills, however, as well as in a considerable number of maneuver skills, the consensus seemed to settle on two gunneries per year. More than two would overcrowd the calendar and erode the quality of the train-up periods. The battalion would also have to rush from one training event to another leaving little time for adequate preparation or for collective dismounted training.

1985

The battalion's gunnery philosophy in 1985 continued to emphasize tactical realism and gunnery as a preparation for combat. The integration of the vehicle crew and the dismounted rifle team was reinforced. A successful dismounted mission again became a requirement for qualification on Table VIII. Platoons still maneuvered as two sections but the requirement for a section qualification was discarded. The enforcement of proper fire commands and other crew actions assumed a new importance.

Additions to the pre-gunnery train-up package included BCPC drills using MILES equipment, which provided very effective training. During 1985, the unit also gained access to the unit conduct of fire trainer (U-COFT). This device, a full mock-up of a Bradley turret, allowed crews to practice crew drills and fire engagements on a routine basis. Similar to a realistic computer video game, the U-COFT had an immediate positive effect on crew proficiency.

The number of Fort Hood units transitioning to the Bradley at that time created ammunition constraints and affected the design of the battalion's pre-qualification tables. Pre-qualification gunnery consisted of the pre-qualification exercise, Phases I-III, and Table VI A&B. Phase I was fired by a single Bradley in eight offensive and defensive engagements using only subcaliber ammunition. Phases II and III were platoon exercises using subcaliber ammunition in 16 engagements.

Table VI was fired by a single Bradley, moving as a section, firing full caliber (TP-T) ammunition in 10 offensive and defensive engagements. Additionally, a firing port weapon training exercise was conducted.

The qualification tables were run in sections, with one vehicle firing and one wingman acting as a spotter. Table VII A&B was the qualification table for command vehicles such as the platoon leader's or the company commander's. Twelve engagements were fired. As there were no squads aboard, a dismount mission was not required.

Table VIII A&B, Squad Qualification, consisted of eight engagements, including an assistant squad leader's engagement while the dismount team was on the ground with the squad leader. Sixty-seven percent of the score was based on vehicle firing and 33 percent on the dismount mission. This meant that if the riflemen did not do their jobs, the squad could not qualify in gunnery.

Targets, ammunition, fire commands, burst techniques, sensing and adjusting rounds, controlling the firing vehicle, and the AAR continued with the same standards adopted in late 1984.

A major change took place, however, in the scoring process. Crews had points deducted from their score for improper fire commands, engaging the least dangerous target first, incorrect driving techniques, or failure to take protective measures such as moving from hull down to turret down position after a defensive engagement.

Killing a target required a three-round hit, and an actual physical count was made of the holes in a target. The targets were exposed for 20 seconds after the vehicle had moved into a position to fire; this was called "unmasking the gun."

The final score placed each squad in one of three brackets: Distinguished (90 percent or above), Superior (80 percent), or Qualified (70 percent). The crews were rated Distinguished or Superior only on the basis of first run scores without refires.

A platoon battle exercise was conducted as an additional table. This exercise, scored and conducted strictly by the ARTEP checklist, began in an assembly area and continued into a movement to contact onto the range where the live fire exercise was conducted.

BRADLEY FIRING	DISMOUNT MISSION	FIRE DISTRIBUTION	OBSTACLE REDUCTION	TACTICAL REPORTING
40%	30%	10%	10%	10%
400 points	300	100	100	100

Table 1. Example of modular gunnery table.

The 2d Armored Division Infantry Gunnery Circular (Draft) was written in 1985. This document formalized the acceptance of standards of qualification in accordance with FM 23-1 (Test) with a few provisions: namely, the requirement for two instead of three gunneries per year, and the positive requirement for a rifle team dismounted mission as part of squad qualification.

An interesting idea called "the modular concept" of gunnery table design appeared in this draft circular and was used during the September 1985 gunnery. The modular concept allowed commanders to tailor their training on the basis of unit mission requirements. The two basic modules were a Bradley firing for the crew and a squad dismount mission. Other training modules with their relative effect on the score could be added for a flexible training event. An example of a modular table is shown in Table 1.

1986

When the battalion rotated to Europe in the summer of 1986, it entered a new era of Bradley gunnery.

Two Level II gunneries -sustainment of skills- were fired at the NATO training area of Bergen in 1986. (Level I, Qualification Gunnery, is conducted only at Grafenwoehr. No Level I qualifications were conducted in 1986.)

The move to Europe had two immediate effects on sustainment gunnery. The Bradley crews' favorite ammunition, AP, could not be fired on European ranges because of its speed and its flat trajectory out to long ranges. All Bradley gunnery in Germany was fired with TP-T, a slow, high-trajectory round that gives a wide dispersion. The negative aspects of TP-T were somewhat reduced by the much shorter range to target. The targets were initially brought in to the 1,800-meter range, and the following year were no greater than 1,600 meters.

The second effect on gunnery was caused by climate and weather. The battalion's squads were not used to firing gunnery tables in fog, snow, and sub-freezing temperatures.

In addition, once the final FM 23-1, Bradley Fighting Vehicle Gunnery (March 1986, with Change 1 in November 1986) had been published, the FM could no longer be viewed as a reference or a convenient point of departure. It was, in fact, the standard. Since the battalion did not fire a qualification in Germany during 1986, however, evaluation of the effect of the new FM 23-1 had to wait until 1987.

1987

The gunnery philosophy for 1987 was quite simple: Since FM 23-1 was the standard, the crews had to qualify under those standards at Grafenwoehr where the qualifications were conducted. The battalion's exciting era of experimentation was at an end.

The negative aspect was the requirement to fire gunnery tables and meet standards that had been created by someone else. The positive side was the expectation that Bradley gunnery had finally reached a point of stabilization, an end to the constantly changing requirements and standards. By 1987, the battalion had fired nine gunneries, no two of them alike in task, conditions, and standards.

Using the systematic approach as outlined in the FM, the pre-gunnery training reached a new level in resources and events during home station training. The resources included the U-COFT, mock-up gunnery tables using MILES, the BGST, the .22 caliber training device used on the mini-tank range, and the M55 laser device.

The following are the home station tables that could be conducted with miniature targets at ranges of less than 100 meters:

- Table I, Zero/Manipulation/Range Card, using the M55 laser or the .22 caliber adapter to the M16 rifle.
- Table II, Gun Lay and Tracking, using subcaliber or M55 laser.
- Table III, Adjustment of Fire (BOT) using subcaliber device.
- Table IV, Acquisition and Engagement Techniques, using subcaliber ammunition.

All of these tables had company BCEs to evaluate and score the crews.

Tables V, VI, and VII, which required local full caliber ranges, were conducted at Bergen. Table V, Vehicle Team Subcaliber Exercise, called for a moving Bradley firing the coaxial machinegun, but limited time and range resources prevented the battalion from firing this table.

Table VI A&B, Vehicle Team Baseline Gunnery, was a stationary Bradley firing full caliber ammunition (TP-T only). The B, or night, portion was fired only by a few companies because ranges were not available. Table VII A&B, full caliber with a moving Bradley, was conducted so as to closely approximate the task, conditions, and standards of Table VIII, Qualification.

The new FM 23-1 divided Table VIII into four parts-A, B, C, and D. Table VIII A&B, Vehicle Crew Qualification, consisted of 12 tasks for a total of 12 vehicle engagements. Four of these tasks, called "swing" tasks, could be moved either to the day or the night portion. No dismounted rifle team tasks were integrated into this part of the table, and no dry runs were allowed for it.

A separate table, VIII C, was called the Rifle Team Qualification (day and night), in which no Bradley was involved.

Finally, Table VIII D, Squad Qualification, integrated the dismount team and vehicle firing. Tables C and D were conducted somewhat later at a local range.

The targets at Grafenwoehr were silhouette type panels at ranges not greater than 1,600 meters. Targets were arrayed for single or dual engagements; there were no triple targets. The thermal target system was excellent. Targets were linked to a computer that recorded exposure time, number of hits, kill time, and other information. The targetry system relieved the battalion of the labor-intensive target details of the past. The ammunition for the 25mm gun was TP-T only, and for the coaxial machinegun it was standard 7.62mm link.

Fire commands were graded, with three types allowed-Battlesight, Precision, and a new one called the Initial fire command. The word "sabot" was substituted for the old term "AP." In the Precision fire command, the gunner ranged the target with the sight instead of having the BC estimate the distance. There was no crew cut for the type of fire command used so long as it was given correctly.

A new burst technique of 1-3-4, which had been developed and tested by a southern USAREUR (U.S. Army, Europe) unit, was adopted by the battalion. This technique made efficient use of the eight rounds allotted for each engagement. An improper burst technique (that is, no sensing round or too long a burst) was a crew cut on points.

Other crew cuts included such items as failure to raise the TOW in a defensive engagement, failure to return to a turret-down position, improper ammunition for the target, engaging the least dangerous targets first, and improper driving techniques.

The Bradley crew evaluators who graded the crews for qualification did not belong to the battalion or even to the division; they were soldiers trained at the BCE course con-

ducted by the 7th Army Training Command. The firing vehicles continued to be controlled by tactical scenarios given over the radio. Fire commands and crew actions were monitored from the tower by means of a "jump" radio. The intercom system of the Bradley was linked by radio, and the commands were broadcast on FM and tape recorded.

Performance time for target kills was based on an assessment of the threat target's ability to kill the Bradley. The matrix for kill times was correlated with the distances to the targets. An example for a defensive engagement at a single target is shown in Table 2.

KILL TIME (3 rounds)	DISTANCE (meters)	POINTS
10 sec.	0-1000	100
15 sec.	0-1,000	70
15 sec.	1,000-1,600	100
20 sec.	1,000-1,600	70

Table 2. Sample target kill matrix.

Kills on area targets (troops) with the coaxial machinegun were based on the use of a Z-pattern, and point targets such as an RPG team required one target hit with 7.62mm.

To qualify, all crews had to score at least 700 points (day and night combined), achieving a score of at least 70 on seven of ten tasks. The crews that scored 800-899 points were rated Superior; those with 900 or more, Distinguished. No crews achieved a perfect score of 1,000 points.

Additional tables included Table XI, the Infantry Platoon Mounted Exercise, and Table XII, the Infantry Platoon Mounted Qualification. These tables contained no tasks for riflemen. The battalion also fired a CALFEX for the company team although range constraints at Grafenwoehr did not allow for free maneuver during this exercise.

1988

Although FM 23-1 has changed once again, the basic gunnery philosophy for the battalion in 1988 still adheres to the manual's standards. The Grafenwoehr experience has forced the battalion to pay attention to the fine details of gunnery and to ruthlessly enforce the standards, beginning with the pre-gunnery train-up. Gunnery, the battalion has discovered, is the most serious business in Europe. It has become something of a spectator sport, and battalion scores at Grafenwoehr are followed as closely as football scores.

Under the new FM 23-1 (September 1987), pre-gunnery train-up remains essentially unchanged. The new FM does bring with it a fundamental change, however, in Table VIII, Qualification. There is no longer a requirement for the dismounted infantry to participate in any of the qualification process. The vehicle crews perform 12 tasks, firing at 12 targets (day and night), and swing tasks are still included.

The firing vehicle is controlled by the task, conditions, and standards rather than by a tactical scenario. All the defensive engagements require the use of a Precision fire command while all offensive engagements require the use of the Battlesight fire command. There is one exception, however. A misprint in FM 23-1 (February 1987) requires the Battlesight fire command in the task 11 defensive engagement. Although it is a known misprint, rigid adherence to the FM standards at Grafenwoehr in February 1988 required all crews to use the Battlesight fire command in this engagement until a change message was received from the Infantry School.

The Initial fire command has been deleted, and there is now the "Reduced" fire command, used when a gunner spots the target first.

The new burst technique used in 1988 is 1-1-3-3, which allows for a second sensing round if the first is not close enough for a minor adjustment. The use of an improper burst technique is no longer a crew cut.

Crew cuts remain extensive, however, and this year include a five-point deduction for using the wrong type of fire command as specified in the task, conditions, and standards. A kill remains three rounds, but the scoring matrix has been simplified to include the range to target.

For area coaxial engagements, two of the targets must be hit with 7.62mm fire rather than the former Z-pattern requirement. For point targets, one hit is required.

Advanced tables have been redesigned as follows: Table XI A&B, Platoon Mounted Exercise; Table XII A&B, Platoon Mounted Qualification; Table XII C, Platoon Dismounted Qualification (no Bradleys involved); and Table XII D, Infantry Platoon Qualification (Bradleys and dismounted riflemen).

In this, the battalion's sixth year of Bradley gunnery, no two gunneries have been the same.

The six years of Bradley gunnery, from the point of view of a single battalion, is perhaps a microcosm of the Bradley gunnery experience. The road traveled has been, ironically, something of a full circle, because the important issues expressed in 1983 have again surfaced.

The assistant squad leader, who according to doctrine is expected to take command of the turret at times, has no role or requirement in the squad qualification process. Tactical realism, or gunnery as preparation for combat, the guiding principle of the early years, is no longer an objective of gunnery that is conducted essentially as a marksmanship exercise. And, finally, the concern that Bradley squads will fragment into a vehicle team and a dismount team if the riflemen do not participate in the actual vehicle qualification process is once again an issue.

It appears, then, that Bradley gunnery will continue to be an important subject for debate in mechanized infantry units for some time to come.

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